

Paracricotopus millrockensis,
a New Species of Orthocladiinae
(Diptera: Chironomidae)
from the Southeastern United States

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ABSTRACT.— The adult male and female, and immature stages, of *Paracricotopus millrockensis* n. sp. are described from specimens collected in Georgia and North Carolina. This species is also known from South Carolina. The new species is clearly separable from other species of *Paracricotopus* in the larval, pupal, and adult female stages. The male is very similar to *P. niger* (Kieff.). The immature stages of *P. millrockensis* have been found in small streams associated with stone substrates, and the larvae feed mainly on detritus and algae.

INTRODUCTION

Saether (1980a) revised and emended the generic diagnoses for all stages and both sexes of *Paracricotopus* Thienemann and Harnisch. In North America only one species of this genus has been described, *Paracricotopus glaber* Saether, from South Carolina. I collected in an urban Georgia stream specimens that, based on Saether's diagnoses, belong to *Paracricotopus*, but the pupal stage clearly differed in several characters from published descriptions of known species. This paper describes the new species and presents information concerning several aspects of its ecology and distribution.

The various life stages were obtained from specimens reared in isolation. All specimens were preserved in 70 percent ethanol prior to mounting on microscope slides. Some specimens were dissected, cleared, or fixed, and all were mounted in Euparal or Canada balsam.

In the following discussions, N= the number of specimens examined, and measurements are usually expressed as the total range. All measurements were made with a calibrated ocular micrometer. Except where otherwise noted, all measurements are given in μm . The numerals in parentheses indicate the number of features used to derive the range given. General terminology follows that of Saether (1980b).

Paracricotopus millrockensis n. sp.

Male.— N = 2; one specimen a mature pupa.

Head. Eyes pubescent, without dorsal elongation. Inner verticals

1-2 (4); outer verticals 2 (4); clypeal setae 6-10 (2). Lengths of palpal segments 2-5: 34 (2), 56 (2), 63 (2), 104-106 (2). Antennal ratio 0.62-0.63 (3); flagellomeres brown with darker brown pedicel.

Thorax. Light brown with brown vittae, preepisternum, scutellum, and postnotum. Anteprepronotum with 1-2 (4) lateral setae. About 5 short acrostichals present on anterior portion of scutum, beginning near anteprepronotum; 6-9 (4) dorsocentrals; 3 (4) prealars; about 4-6 (2) scutellars. Haltere very faintly brown with basal area darkest.

Wing. Length from arculus to tip 0.97 (2) mm, maximum width 0.32 (2) mm; V.R. of 0.93 (2); 3 (2) squamals.

Legs. Sensilla chaetica not evident at 500X. Lengths and proportions:

	fe	ti	ta ₁	ta ₂	ta ₃
P ₁	389-394(2)	389-418(2)	267(1)	209(1)	162(1)
P ₂	371-377(2)	354-377(2)	162(1)	96(1)	75(1)
P ₃	360-371(2)	412-417(2)	220(2)	125-128(2)	104-110(2)
	ta ₄	ta ₅	LR	SV	BV
P ₁	104(1)	---	0.69(1)	2.91(1)	---
P ₂	41(1)	49(1)	0.43(1)	4.65(1)	3.51(1)
P ₃	52(2)	52(2)	0.53(2)	3.51-3.58(2)	3.03(2)

Abdomen. Pale brown. Tergites with anterior row of about 2-4 setae, and median row of about 5-7 setae. Hypopygium as shown in Figure 1. Anal point 17-26 (2) long with 2 or 3 setae on each side. Laterosternite IX apparently with 1 or 2 setae. Gonocoxite length 126 (4); gonostylus length 52-60 (4); apical spine of gonostylus 9 (4) long. Phallapodeme 46-49 (4) long; transverse sternapodeme 63-74 (2) long. H.R. of 2.10-2.42.

Female.— N = 3; one specimen a mature pupa. Similar to male except for the following differences.

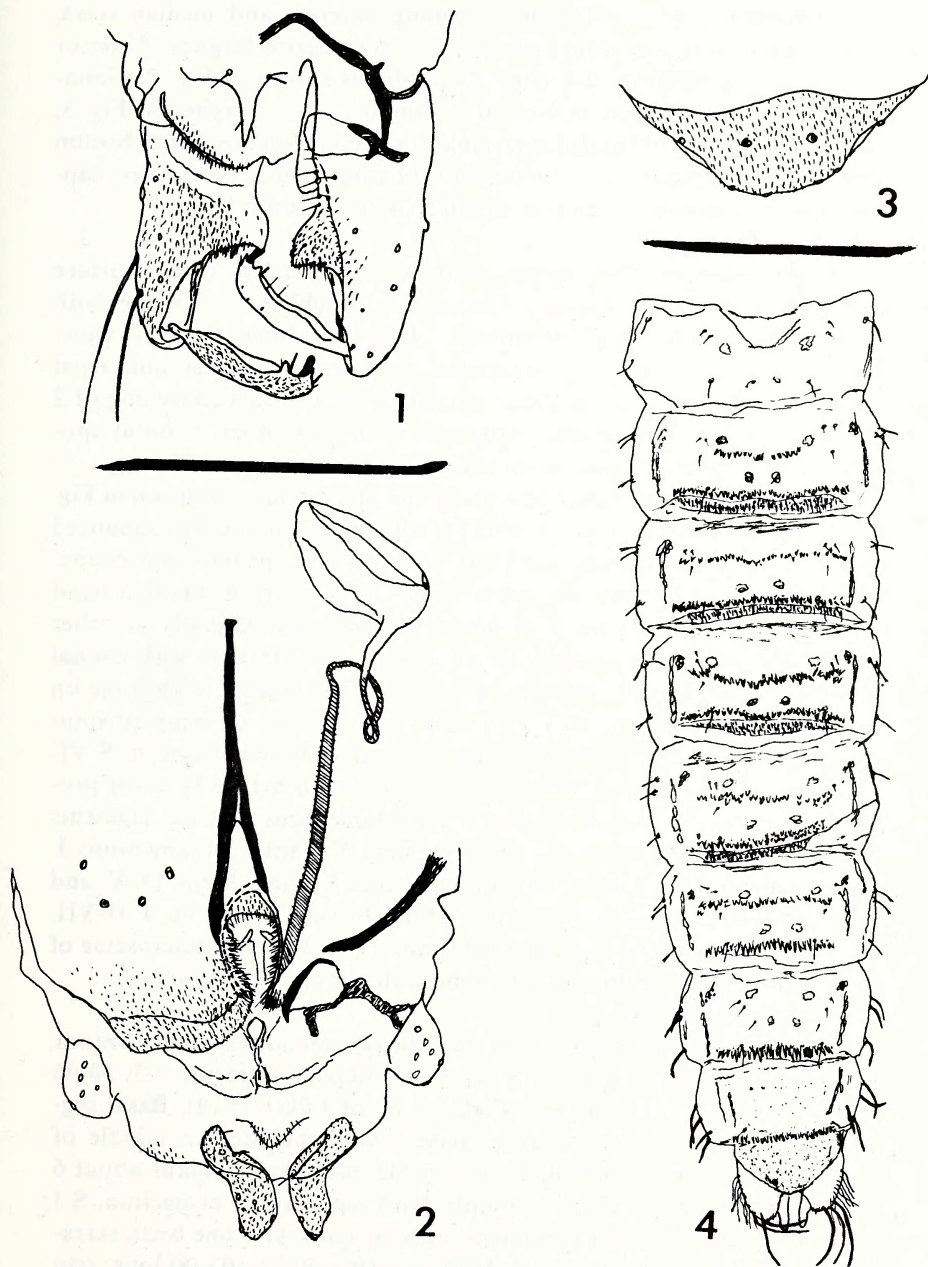
Head. Inner verticals 2-3 (6); outer verticals 3 (6); clypeal setae 11-12 (2). Lengths of palpal segments 2-5: 31-34 (2), 57 (2), 60-63 (2), 109 (2). Antennal flagellomere lengths: 56-49 (6), 29 (6), 26-29 (6), 27-31 (6), 54-66 (5). Coronal suture absent.

Thorax. 7-8 (3) acrostichals.

Wing. Length from arculus to tip 0.09-0.95 (4) mm; maximum width 0.36-0.39 (4) mm; 3-5 (4) squamals; V.R. of 0.92 (4).

Legs. 9 and 11 or 12 sensilla chaetica evident on ta₁ of p₂ and p₃, respectively. Lengths and proportions:

	fe	ti	ta ₁	ta ₂	ta ₃
P ₁	377-394(3)	389-435(4)	206-232(4)	145-157(4)	110-116(4)
P ₂	336-377(4)	313-383(4)	139-157(4)	75-87(4)	64-67(4)
P ₃	336-365(4)	383-406(4)	186-203(4)	99-110(4)	84-99(4)
	ta ₄	ta ₅	LR	SV	BV
P ₁	64-81(4)	52-58(3)	0.52-0.57(4)	3.40-3.67(3)	2.55-2.56(2)
P ₂	35-41(4)	44-52(4)	0.39-0.44(4)	4.67-5.09(4)	3.57-3.88(4)
P ₃	44-46(3)	49-52(4)	0.49-0.50(4)	3.76-3.91(4)	3.15-3.20(3)



Figs. 1-4. *Paracricotopus millrockensis*, Male: 1, hypopygium, dorsal view to the left, ventral view with internal structure to the right; 2-3, Female: 2, genitalia, ventral view, with internal structure to the right; 3, T IX, dorsal view; Pupa: 4, abdominal tergites and anal end.

Abdomen. Setae on tergites forming anterior and median rows, though separation sometimes not distinct on posterior tergites. Anterior row consisting of about 2-4 setae. Genitalia as shown in Fig. 2. Gonocoxite IX with 3-4 larger, and about 3-5 smaller setae. Tergite IX, Fig. 3, without indication of caudal emargination. Cerci 57-66 (6) long. Notum with a light triangular area at junction of rami. Ducts of seminal capsules much narrower in anterior length than in posterior length.

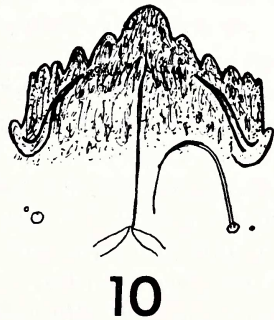
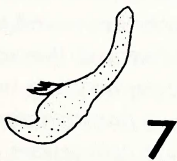
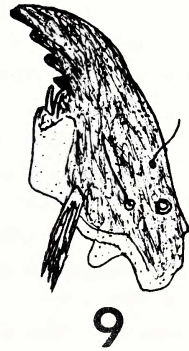
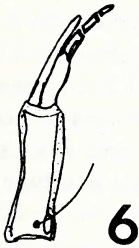
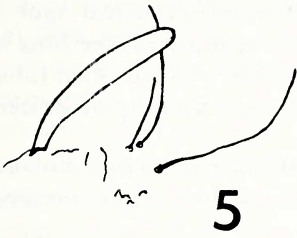
Pupa.— N = 6.

Cephalothorax. Pale brown. Thorax with much of dorsal surface reticulate and faintly rugose. Thoracic horn (Fig. 5) elongate with rounded apex, entire surface smooth, 74-157 (10) long, 10-20 (7) wide. Median anteprenotals 2; precorneals 3, with Pc_2 longest and most robust, and Pc_3 shortest and least robust. Dorsocentrals consisting of 2 pair with Dc_1 and Dc_2 widely separated from each other. Frontal apotome slightly to moderately wrinkled; FS on prefrons up to 57 long.

Abdomen. Pale brown. Chaetotaxy and other details as shown in Fig. 4. T I-VII without shagreen. T VIII-IX with shagreen, most pronounced on T IX, and very sparse on VIII. T II-VI with median and caudal bands of spines and spinules; a few spines bifid or trifid. Median band of spines and spinules on T II not extended as far laterally as other bands, and may appear interrupted medially. T VII-VIII with caudal spines and spinules only. Spines on T VI and VII longest, with some up to 23 long. Conjunctives of T II-VI with several rows of recurved spinules. Sternites II-VIII with faint, uniformly distributed shagreen. S VI-VII with a few caudal spinules. Pedes spurii A on S IV-VII, most pronounced on S VI. Segment I with 2 non-filamentous L setae, segments II-VI with 3 non-filamentous setae, segment VII with 3 filamentous L setae, segment VIII usually with 4 filamentous L setae. Many D, V, and non-filamentous L setae appearing bifid. Dorsal O setae on T II-VII. Anal lobe with about 2-4 small apical spines and 3 curved macrosetae of about equal length. Fringe of anal lobe with about 7-12 (12) setae.

Larva.— N = 9; final instar.

Head. Yellowish brown with dark brown mandibles and mentum. Antenna as shown in Fig. 6. Lengths of antennal segments 1-5; 40-46 (12), 17-20 (12), 7 (12), 6 (12), 4 (12); A.R. of 1.08-1.35 (4). Basal segment 17 (11) wide; ring organ at base; blade extended to middle of fourth segment; accessory blade not visible; lauterborn organs about 6 (6) long. Premandible (Fig. 7) simple, with mesal spiny projection. S I appearing simple in most specimens, apex at most with one weak serration. Maxilla as shown in Fig. 8. Mandible (Fig. 9) 94-103 (8) long; seta interna with several branches. Mentum (Fig. 10) with slightly peaked, but generally rounded median tooth 19-20 (4) wide; median tooth sometimes weakly notched on each side; fifth lateral tooth small. Ventromental plates about 2-3 (8) wide. Width of ventromental plate/width of median tooth 0.10-0.16. Postmentum 126-134 (8) long.



Figs. 5-10. *Paracricotopus millrockensis*, Pupa: 5, thoracic horn and precorneal setae; 6-10, Larva: 6, antenna; 7, premandible; 8, maxilla, ventral view; 9, mandible; 10, mentum and postmental area.

Abdomen. Procerci dark brown, up to 26 long, 17 wide, with a basal curved spur and 2 short median setae. Preapical procercal spur not developed, represented at most by a slight protrusion. Three long and two shorter anal setae; longest seta about 450-500 (3) long. Anal tubules slender, gradually tapering, and about 2.5 times as long as posterior parapods.

Etymology.— The species is found in Millrock Branch, a stream in Rockdale County, Georgia, that supports a most diverse and interesting chironomid fauna.

Holotype.— Reared ♂, with exuviae, Millrock Branch at Haralson Mill Road (83°57'24" N, 30°45'41" W), Rockdale County, Georgia, 3 VII 83, leg. B. A. Caldwell. Holotype specimen deposited in the Florida State Collection of Arthropods (Tallahassee).

Paratypes (9).— Reared ♀ (allotype), with exuviae, same data as holotype; reared ♀, with exuviae, same data as holotype; ♂ prepared from mature pupa, with exuviae, same data as holotype except 3 VI 82; mature ♀ pupa, with exuvium, same data as holotype except 2 VI 78; ♀ pupal exuvium, same data as holotype except 20 III 82; 2 larvae, final instar, same data as holotype; larva, final instar, same data as holotype except 19 VII 77; larva, final instar, Huffines Mill Creek, Rockingham County, North Carolina, VIII 81, leg. D. R. Lenat. All paratype specimens are deposited in the Florida State Collection of Arthropods (Tallahassee).

Diagnosis.— Males of *Paracricotopus niger* (Kieff.) and *P. uliginosus* (Brund.) are very similar structurally, as has been noted by Albu (1968) and Saether (1980a). *Paracricotopus millrockensis* is very similar to these two species structurally, and consistent separation may not be possible. I have not borrowed the type material, but differences in these species might be discovered in the structure of the aedeagal lobe and gonostylus. Males of *P. millrockensis* are separable from those of *P. glaber* by differences in the hypopygium, especially gonocoxite length, aedeagal lobe size and shape, and gonostylus shape. In the female, *P. millrockensis* is most similar to *P. niger*, but differences are found in the genitalia, especially the shape of the coxosternapodeme and the ventral lobe of gonopophysis VIII. In lateral view, prior to embedding in balsam, the allotype female was noted to have a thinner notum than that illustrated by Saether (1980a, Fig. 2A). Also, there are differences in leg lengths and ratios. The larva and pupa of *P. millrockensis* are separable from the other described species in the genus by several characters. In the pupal stage, *P. millrockensis* can be separated by the smooth elongate thoracic horn, different abdominal chaetotaxy, and different anal lobe. Its anal lobe is very similar to that of *P. niger*, based upon the figure of Thienemann (1950). Saether (1980a), however, reported 8-15

apical spines with an average of 10 in specimens that he examined. *Paracricotopus millrockensis* differs from *P. glaber* in having apical anal lobe spines and an anal fringe. The larva of *P. millrockensis* is separable from these other species by the apparently simple S I, shorter postmentum, lack of a developed pre-apical procercal spur, minor differences in mentum structure, and the anal tubules, which are about 2.5 times as long as the posterior parapods. Other characters that may further separate *P. millrockensis* from the structurally similar *P. niger* include a lower A.R., more posterior position of the submental setae, and apparent differences in the shape and size of the anterior lacinal chaetae of the maxilla (cf. Saether 1980a:138).

Range.— *Paracricotopus millrockensis* has been collected in Georgia and North and South Carolina. The preferred habitat appears to be low order streams in the Piedmont and Blue Ridge Provinces. In Georgia, this species has been collected in Cascade Branch, Habersham County, and in Millrock Branch, Rockdale County. In South Carolina, it has been collected in Boone Creek, Oconee County. In North Carolina, specimens of this species have been collected in Beaverdam Creek, Wake County, Huffines Mill Creek, Rockingham County, and in an unnamed stream, Macon County. The species is likely to occur in similar streams in other southeastern states.

Ecology.— In North and South Carolina streams, and Georgia streams other than Millrock Branch, larvae have been collected from among stone substrates in qualitative samples. In the Georgia stream locally known as Millrock Branch, the species has been collected by hand-picking from very shallow water on granitic bedrock among moss and detritus. In this stream, most larvae have been found in association with *Hudsonimyia parrishi* Caldwell and Soptonis. Some other chironomids found in the same microhabitat, but not necessarily at the same time, are listed in Caldwell and Soptonis (1982). Millrock Branch drains a relatively undeveloped, unpolluted watershed with dissolved oxygen values near saturation. D. Lenat (pers. comm.), however, has collected larvae in some North Carolina streams influenced by pesticides and other pollutants. This would suggest that the species is not a good indicator of water quality.

Detritus, fungi, and algae constitute the majority of food observed in gut contents of several larvae.

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LITERATURE CITED

- Albu, Paula. 1968. Chironomide din Carpatii Românești (III). Stud. Cercet. Biol. Ser. Zool. 20:455-465.
- Caldwell, Broughton A., and A. R. Soptonis. 1982. *Hudsonimyia parrishi*, a new species of Tanypodinae (Diptera: Chironomidae) from Georgia. Fla. Entomol. 65:506-513.
- Saether, Ole A. 1980a. The females and immatures of *Paracricotopus* Thienemann and Harnisch, 1932, with the description of a new species (Diptera: Chironomidae). Aquat. Insects 2:129-145.
- . 1980b. Glossary of chironomid morphology terminology (Diptera: Chironomidae). Entomol. Scand. Suppl. 14:1-51.
- Thienemann, August. 1950. Lunzer Chironomiden. Arch. Hydrobiol. Suppl. 18:1-202.

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